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POLICY BRIEF

Planning for climate change in Africa's maritime transport sector

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A two-pronged, adaptive and proactive approach to addressing climate change in Africa's maritime transport and ports sector is needed. By reducing emissions and building climate resilience in the maritime sector, Africa can aim to future-proof the sector by both mitigating its environmental impact and strengthening its capacity to withstand climate-related disruptions, while supporting the sustainable development of its blue economy.

Key findings

- Shipping and maritime transportation play a key role in Africa's blue economy, serving as essential components for economic development, regional integration, and global trade.
- Africa's maritime trade has experienced notable growth over the past five years, reflecting the continent's increasing integration into global trade networks.
- Climate change presents both a direct threat and a planning challenge for Africa's maritime sector. Sea level rise, extreme weather events, and shifting global emissions regulations are already impacting shipping infrastructure and future trade competitiveness.
- Africa's maritime sector must adopt a dual strategy: reduce emissions and build climate resilience.
- The 2025 approved carbon levy introducing a carbon price and emissions fuel standard for the shipping sector requires a regional policy response.
- Regional cooperation, policy harmonisation, and shared innovation are key to scaling sustainable maritime practices.
- A new continental maritime governance framework is needed, to support Africa's urgent transition to decarbonisation, environmental sustainability, and climate resilience.

Recommendations

African Union Commission working with regional economic communities:

- Build regional cooperation across the continent to amplify efforts towards reducing the carbon footprint and strengthening the resilience of Africa's maritime sector through regional centres of excellence.
- Develop regional frameworks to standardise emission reduction measures and integrate climate risk assessment through all stages of port development and refurbishment.
- Engage with multilateral development institutions, development banks and funders, private investors and port operators to secure finance and investment and promote innovation.

National transport ministries and ports authorities:

- Prioritise modernising shipping fleets and practice to align with International Maritime Organization emission reduction targets, incentivising private sector investment and establishing design standards that enhance the structural integrity of port infrastructure to withstand changing climate conditions.
- Develop and implement multi-year plans for transforming ports into green logistics hubs, promoting energy efficiency, renewable energy sources, environmental sustainability, and climate resilience.
- Engage shipping companies, port operators, technology providers, and centres of excellence to implement training programmes and early warning systems for maritime workers to operate and maintain green and climate-resilient technologies and operating systems effectively and increase resilience.
- Work with local authorities and relevant non-governmental organisations to ensure coastal communities benefit from green initiatives through job creation, equitable revenue sharing, and enhanced socioeconomic opportunities.
- Incorporate climate risk assessments into port development and refurbishment projects by including sea level rise projections, extreme weather event scenarios, and long-term climate trends in the design and maintenance of infrastructure.

Africa's maritime sector: central to its blue economy

Climate change presents a direct threat and a planning challenge for Africa's maritime sector. Sea level rise, extreme weather events, and shifting global emissions regulations are already impacting shipping infrastructure and future trade competitiveness.

Shipping and maritime transportation are critical in Africa's blue economy, serving as essential components for economic development, regional integration, and global trade. Africa's maritime trade has experienced notable growth over the past five years, reflecting the continent's increasing integration into global trade networks. For example, between the first half of 2018 and the first half of 2023, port calls by container ships increased by 20%, while tanker calls grew by 38%.[1] The challenge is to navigate the global shift towards reducing emissions in shipping and ports, and to build resilience to sea level rise and other climate change impacts.

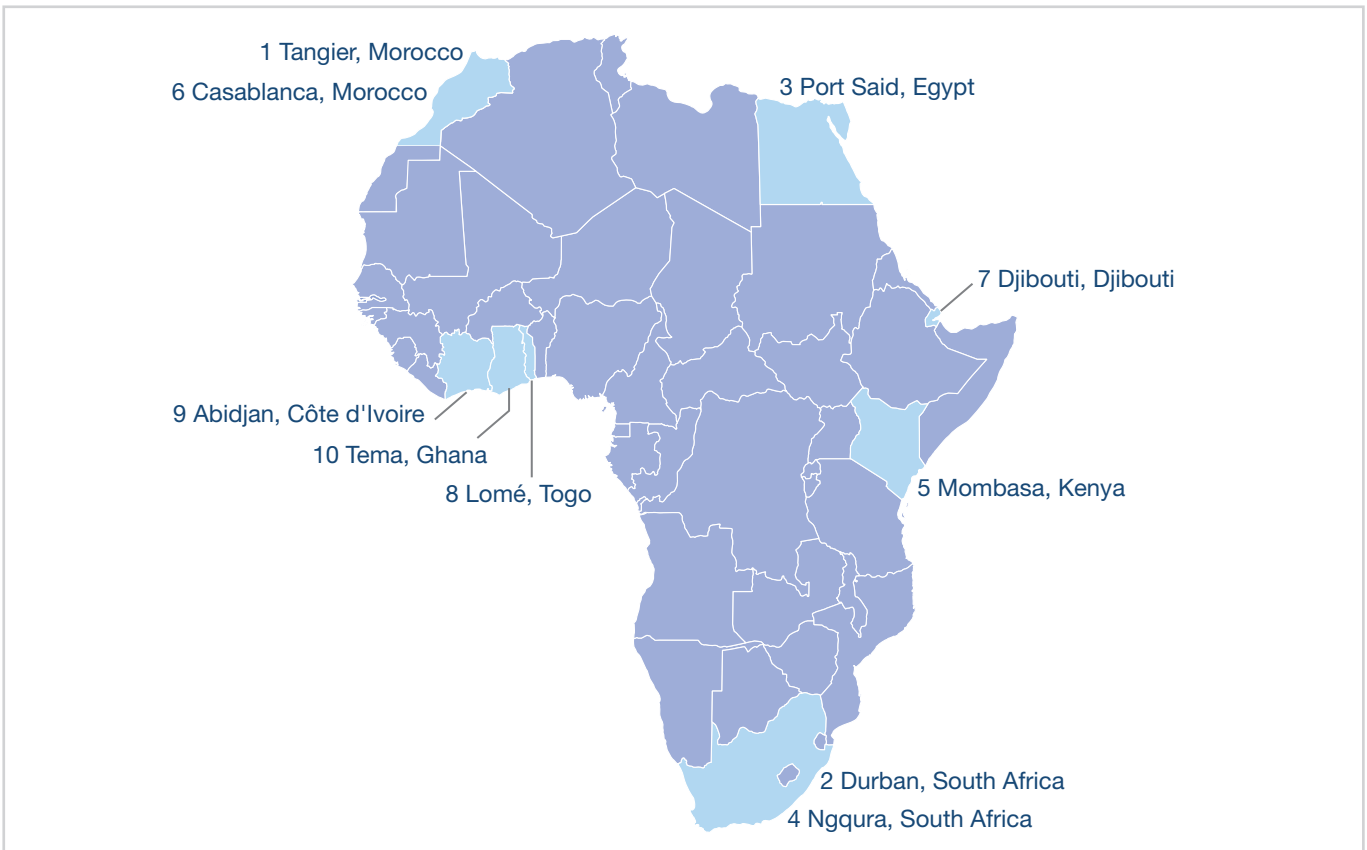
Over 90% of Africa's trade is conducted via maritime routes along the continent's coastline, where millions of tonnes of goods are handled annually through approximately 100 ports. It is estimated that the output of these ports will continue to increase, possibly reaching as much as two billion tonnes by 2040.[2]

These ports are strategically located along Africa's vast coastline. They facilitate the movement of goods to and from key global markets in Europe, Asia, the Americas, and other regions, supporting a global maritime industry worth approximately US$1 trillion a year with substantial scope for growth. (Chart 1 shows Africa's top 10 ports by volume.)

Over 90% of Africa's trade is conducted via maritime routes along the continent's vast coastline

African ports do not, however, perform well in global rankings on port efficiency, and there are high costs associated with the transport of goods, particularly for island and inland states.

Chart 1: The top 10 ports in Africa by volume in twenty-foot equivalent units[3]



Shipping, trade, ports, and maritime safety are included among the thematic areas of the African Union's (AU) Africa Blue Economy Strategy.[4] The strategy seeks to integrate environmental considerations into policy and facilitate the development of Common African Positions through multi-stakeholder engagement. Investing in modern, efficient ports and expanding capacity is central to the strategy,[5] and essential for accommodating the growing volume of maritime trade.

Improved port infrastructure not only enhances the efficiency of maritime transportation but also attracts foreign investment, boosting the overall economic competitiveness of African countries. Significant investments in port infrastructure have been made to accommodate this growth, for example, in Lamu in Kenya,[6] Lomé in Togo, Tema in Ghana, Lekki in Nigeria, and Abidjan in Côte d'Ivoire.[7] (See below for how sustainability has been incorporated into Lekki Port.) These developments are an indication of Africa's commitment to enhancing its maritime capabilities, thereby facilitating increased trade volumes and contributing to economic growth across the continent.

The maritime transport sector generates substantial employment opportunities, not only in direct shipping activities but also in associated industries such as shipbuilding, port operations, logistics, and marine services. Ports act as focal points for economic activities, creating jobs and supporting the livelihoods of millions of people in coastal communities. With the rise of global e-commerce, ports are evolving into logistics hubs, integrating warehousing, distribution, and transportation services to cater to growing consumer demand.

With the rise of global e-commerce, ports are evolving into logistics hubs to cater for growing consumer demand

Policy frameworks for adapting the shipping and maritime industry to climate change need to incorporate two key facets: (i) reducing greenhouse gas (GHG) emissions to minimise the industry's contribution to global climate change and marine pollution, and (ii) enhancing the

Key green features and sustainability efforts at Lekki Port[8]

Lekki Port in Nigeria was opened in 2023 and has been designed as a modern, efficient port with state-of-the-art technology to reduce congestion and improve cargo handling efficiency, which can lead to lower emissions per unit of cargo. The port's development is backed by a public-private partnership model that includes foreign investment and technology transfer, allowing for the integration of global best practices, including environmental standards.

Though not yet fully realised, Lekki Port has the structural capacity for integrating renewable energy sources like solar to power parts of its operations, aligning with the push for green energy in African ports. The project has undergone environmental impact assessments to manage ecological impacts, with commitments to sustainable dredging, waste management, and ecosystem protection.

Other African ports such as Tema Port in Ghana, the Port of Abidjan in Côte d'Ivoire, and Lamu Port in Kenya, are also moving towards greener operations through modernisation projects that include enhanced energy efficiency, cleaner fuel use, and improved waste and water management systems.

Mauritius is working towards a greener port by implementing sustainability initiatives such as energy efficiency and the reduction of carbon emissions through modern port infrastructure and renewable energy integration.[9] Green port development in Africa faces barriers such as limited financing, technological gaps, and regulatory inconsistencies, but there is growing momentum. International partnerships, climate finance, and alignment with International Maritime Organization goals offer strong opportunities for scaling green port initiatives across the continent. These initiatives signal a growing commitment to green port development in Africa, and the lessons learnt should be shared regionally, and successes replicated.

resilience and adaptive capacity of ships and ports to withstand the growing impacts of a changing climate.

The strategic vision for the contribution of Africa's maritime sector to the continent's blue economy was first articulated in the 2050 Africa's Integrated Maritime Strategy[10] and the African Maritime Transport Charter,[11] which advance the vision and principles of environmental sustainability. While visionary at the time, they are now dated and lack the necessary strategic direction for current realities. In December 2024, the International Maritime Organization (IMO) convened the 7th Association of African Maritime Administrations (AAMA) Conference in Tanzania, focusing on concrete actions to shape the region's maritime future.[12]

The need for a new continental maritime governance framework was recognised, but with an apparent lack of urgency, considering the sector's centrality to Africa's blue economy and the immediate need to pivot towards digital transformation, decarbonisation, environmental sustainability, and climate resilience.

Africa must navigate the potential economic impacts of global emission reduction targets and ensure that port investments are resilient to the impacts of climate change

China, a major investor, builder, and operator in Africa's port infrastructure, has signalled the prioritisation of investment in green port infrastructure in the outcomes of the 2024 Summit of the Forum on China-Africa Cooperation (FOCAC).[13] This, together with the outcomes of the 7th AAMA Conference, could provide the needed impetus for a new and fit-for-purpose policy directive at the regional and sub-regional level.

At the national level, in general, maritime strategies broadly prioritise sustainability and environmental protection, but are thin on details. Most National Adaptation Plans do not address adaptation measures for ports and shipping. National marine spatial planning processes are starting to integrate climate scenarios in spatial planning, but will have minimal influence on port design.

Reducing emissions and enhancing energy efficiency

Africa must navigate the potential economic impacts of global emission reduction targets and ensure that port investments are resilient to the potential impacts of climate change. Maritime transportation is a significant source of GHG emissions and marine pollution, including oil spills and waste discharge. The maritime industry accounts for 3% of global GHG emissions and has seen a 20% increase in emissions over the past decade. Without action, emissions could reach 130% of their 2008 levels by 2050.[14]

The 2023 IMO Strategy on Reduction of GHG Emissions from Ships[15] aims to reduce emissions by up to 30% by 2030 and 80% by 2040 to reach net zero

THE MARITIME INDUSTRY HAS SEEN A

20%

INCREASE IN EMISSIONS OVER THE PAST DECADE

by 2050. In April 2025, the IMO approved a carbon levy on ships, introducing a carbon price and a GHG emissions fuel standard for the shipping sector.[16]

While this represents a significant step towards reducing global shipping emissions, the full impact on African states remains uncertain. To mitigate potential negative effects, the revenue generated from the levy must be allocated in a manner that supports the transition to cleaner shipping technologies in developing nations, including investing in green fuel production, enhancing port infrastructure and building capacity within the maritime sector.

Sustainable financing will be needed for fleet upgrades and port modernisation efforts, including through private sector investment and development banks

Further work is needed to enable Africa's maritime sector to navigate the global emission reduction transition. This includes adopting cleaner technologies, retrofitting vessels with energy-efficient engines, and using cleaner fuels. In addition, efforts should focus on expanding green port practice to include renewable energy use, improving fuel efficiency and optimising cargo handling processes to lower emissions.

Sustainable financing will be needed for fleet upgrades and port modernisation efforts, including through private sector investment, development banks, and partnerships with institutions such as the IMO. Harmonisation of maritime emission reduction policies across the continent will support regional collaboration in the transition.

Building resilient ports

Ports are exposed to natural hazards due to their location along open coasts or in low-lying estuaries and deltas, and are therefore affected by rising sea levels, storm surges, extreme waves and wind, and river flooding. Higher mean sea levels, combined with future extreme storm surges, waves and tides, can pose a threat to seaports across the globe. Extreme sea level events that occur only once in 100 years can be expected to occur as frequently as once every 10 years.[17]

GLOBALLY, PORT-SPECIFIC RISK IS ESTIMATED AT

US$7.5 billion

A YEAR

Climate hazards affect port infrastructure and operations through damage to assets, operational delays, and health and safety risks. In addition to sea level rise, impacts could include limitations to manoeuvrability, and delayed berthing and loading/unloading operations from high winds. They could also include limitations to seaport staff's ability to work outdoors safely due to extreme conditions, and limitations to visibility due to heavy precipitation, among others.[18]

Increased shipping and unpredictable, extreme weather can increase the risk of oil spills and other pollution events. There are also risks of indirect

or secondary economic, social and environmental consequences, including temporary closure of facilities with severe financial, employment and trade implications. In summary, climate change will influence the levels of risk and, therefore, change the maintenance requirements on existing ports, as well as the levels of risk that should be considered during the planning of new ports.[19]

The sea level rise projections have important implications for building port resilience. Ports are assets with long lifespans, which means that design for refurbishment, maintenance and new infrastructure must factor in long-term climate scenarios. Globally, port-specific risk is estimated at US$7.5 billion a year. An additional US$63.1 billion of trade is at risk every year, with the highest impact being experienced by Small Island Developing States.[20]

These economic impacts can have ripple effects throughout the region, affecting trade, employment, and economic development. Proactive adaptation measures such as improving port infrastructure, implementing climate-resilient technologies, and developing climate change adaptation strategies can help to mitigate these impacts and build resilience in African ports.

Notes

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